Personal Knowledge Management In Learning: Exploring Concept Mapping For Creative Process

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ABSTRACT

Concept Mapping is one of the Personal Knowledge Management (PKM) tools used to visualize tacit knowledge. This paper will introduce theories on PKM and the roles of concept mapping in PKM. This includes a discussion on the explorations of Concept Mapping in managing creative design process, externalizing and understanding knowledge, communicating and exploring ideas. A pilot experiment is demonstrated to understand the roles of concept mapping in multimedia learning environment at different multimedia design stages.

Keywords

Personal Knowledge Management, Concept Mapping, Creative Process

1.0 INTRODUCTION

As knowledge is created invisibly in human brain, Kidwell et.al (unknown) explained the importance to capture tacit knowledge especially the know-how and learning experience embedded in the minds of people in an organization. Similarly, Wiig (2004) expressed the importance of people-focused knowledge management to determine the success or failure of organizational knowledge.

As such, many practitioners show their interest in Personal Knowledge Management as the tool to approach, organize, integrate (Frand & Lippincott, 2005), retrieve, evaluate/access, analyze, present, secure and collaborate around information (Dorsey, unknown).

Various tools were introduced to support PKM processes such as Index/Search, Meta-Search, Associative-Link, Concept Map and to name a few. According to Tsui (2004), Concept mapping is one of the visualization tools used to organize and connect different chunks of information, as well as to support personal and collective brainstorming for PKM. In an educational environment, it is used to demonstrate science (Horton et al. 1993; Williams et al., 2004), psychology (Cañas et al., unknown) and engineering (Phan Lee, 2004) by capturing the internal knowledge and making it explicit in visual and graphical form that can be easily examined and shared.

While most of the concept map research focused on knowledge elicitation, some authors however presented concept maps as flowcharts of idea, with defined hierarchical levels for each concept and connection (Kelly and Odam, 1997), at the same time performed as a planning tool or as an alternative to essay writing and storyboarding (Cañas et al., unknown).

2.0 EXPLORING CONCEPT MAPPING IN CREATIVE PROCESS

A pilot experiment was carried out in a studio-based learning environment consisting of 70 students of second year for Digital Media degree. The class objective is to expose students to the development process of multimedia application for various mean of expressions such as e-learning, cd-rom, websites development and multimedia entertainment. The experiment was deliberately designed for second year students as they first started their majoring into design subjects.

This experiment adopted Digital Media Design Process (Table 1) as the base for the multimedia development. The process consisted of four key phases in which each phase was conducted iteratively with formative evaluation (Marlia, 2005; Marlia, Woods & Rafi, 2006) namely:

- Phase 1: Design Requirement
- Phase 2: Conceptual Design
- Phase 3: Design Development
- Phase 4: Testing

Concept Mapping was introduced in Phase 1 where the students presented their information search as concept map illustration, whereas in Phase 2 they represent the ideation flow process.

Table 1: Digital Media Process

PHASE	WEEKS	PROCESS
1 DESIGN REQUIREMENT	**1-2**	Briefing and Proposal Review
	3-4	Precedent Study
2 CONCEPTUAL DESIGN	**5-7**	Ideation and Design Documentation
3 DESIGN DEVELOPMENT	**8-10**	Digital Design Documentation
	9-12	Digital Prototype
4 TESTING	**13-14**	Final Product

Kuhlthaus's model of information search (Table 2) was also used as a reference to understand the correlation between stages and affective level of the output in learning process involved (Schreiber and Harbo, 2004).

In Phase 1, the students were briefed of the project theme and required to propose a project title, domain of study and project statement in reference to the theme. For example, in the theme of 'pain' and 'loss', the students described the ideas by establishing the issues from general to a more specific content as shown in Figure 1 and Table 3.

Table 2: Carol Kuhlthaus's Six Stages Model of Information Search

STAGES OF THE MODEL	AFFECTIVE LEVEL: FEELINGS
1. Initiation	**Incertaint**
2. Topic Selection	**Optimism**
3. Prefocus Exploration	**Confusion, Frustration and Doubt**
4. Focus formulation	**Clarity**
5. Information collection	**Sense of direction/ confidence**
6. Writing	**Satisfaction or dissatisfaction**

Table 3: Carol Kuhlthaus's Six Stages Model of Information Search and the context of study

STAGES OF THE KUHLTHAUS'S MODEL	CONTEXT
1. Initiation	**The problem of pain**
2. Topic Selection	**Physical type, Mental type, Spiritual type, Emotional type**
3. Prefocus Exploration	**Negative Consequences of Pain, Positive Consequences of Pain**
4. Focus formulation	**Why and How Pain make one strong**
5. Information collection	**Why suffering is Good**
6. Writing	**Finalized Concept Map**

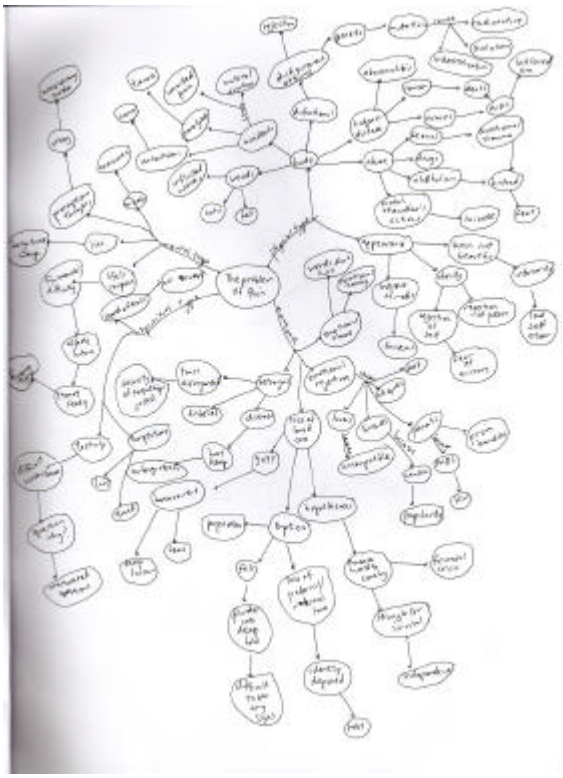

Figure 1: Concept Map showing the domain knowledge of multimedia application entitled 'When I am weak, then I am Strong"

Figure 2 described the Ideation of multimedia application "Life is Pretty yet Wild"- an interactive art application on obstacles in life. Focus on five main concepts - *Society, Human Relationship, Physical, Natural Forces* and *Spiritual* was formulated from knowledge elicitation concept map (Figure 2) and Ideation concept map will *then* further explained the situation that leads to cause and effects of the obstacles. The metaphor of imaginary scene of wild jungle constructed to represent the unexpected obstacles in life. As an example of the scenario*: The character will be in the wild jungle and met with sheep that transformed into wolf. The metaphor represents the human relationship in life, which indicate the broken trust and betrayal by friend.*

This stage was then continued in Phase 2 where all ideas were visualized into a more explicit form. The goal is primarily to ensure and test the students' ability to model their execution flow.
The students were required to develop the details of the 'look and feel' including visuals and brief explanation on multimedia elements needed presented in the Content Sheet (Figure 3).

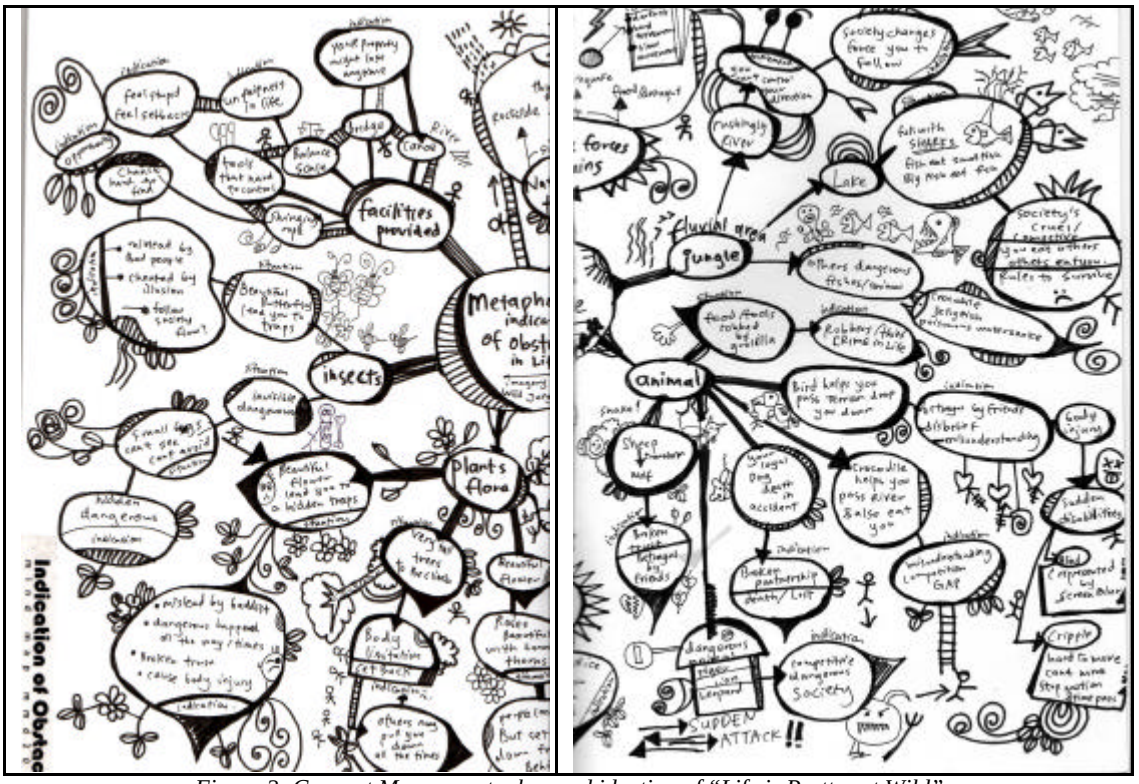

Figure 2: Concept Map on metaphor and ideation of "Life is Pretty yet Wild"

The results of this experiment have shown that the key problem faced by the students is the ability to demonstrate design ideas into expression. In many instances, the initial ideas that they planned were basically missing in the transition exploration of the execution exercises.

These knowledge losses were due to the fact that; (1) failed to record the tacit knowledge and understanding, (2) lacked of the ability to interpret and establish content into context and (3) lacked of the software and technology skill sets. On the other hand, those who managed to demonstrate deep understanding on the domain knowledge of selected topic had illustrated a clearer ideation flow and visualization in interactive form of documentation as shown in Figure 3 and Figure 4.

Figure 3: Content Sheet

Figure 4: Screen capture of final multimedia application

Even though, this experiment may not be presented as the true result of the relationship between information searching, ideation, conceptual design to digital design and final application in multimedia development process, the attempt to use concept mapping as personal knowledge tool has taken a step forward to promote concept mapping among learners and investigate its effectiveness in multimedia learning environment. Despite the fact that only 10% of the students have shown the positive and consistent development from this experiment, the potential of concept map may open into a different model for multimedia teaching and learning.

4.0 CONCLUSION

The exploration of Concept Mapping as PKM tool in creative process has great potential to become a knowledge elicitation tool in information search as well as a visualization tool of ideation stage. Apart from this, Concept Mapping also suggests individual to learn

on how to structure information, understand the problems related and apply ´constructivism´ approach in the learning process. The results of this experiment will be used as a stand point to further develop a proper research investigation with higher statistical samples in developing a model for multimedia-based learning concept mapping and managing knowledge in multimedia learning.

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